

1.0 INTRODUCTION

1.1 PROJECT BACKGROUND AND PURPOSE

The Cool Creek Watershed drains significant portions of the City of Carmel and the Town of Westfield. The watershed and corporate boundaries for Carmel and Westfield are illustrated in Figure 1-1. The watershed drains approximately 23.7 square miles, with its headwaters near its headwaters near 199th Street. Cool Creek flows south and southeasterly, discharging into the White River south of 116th Street. Tributaries include Hot Lick Creek, Little Cool Creek, Highway Run, Mary Wilson Drain, Osborn & Collins #2 Drain, H. G. Kenyon Drain, and Anna Kendall Drain. US 31 and SR 431 run through the middle portion of the watershed. The Westfield portion of the watershed contains both urbanized areas as well as significant tracts of undeveloped land (primarily agricultural). The Carmel portion of the watershed is fully urbanized. Portions of the watershed lie in unincorporated Hamilton County, but are subject to potential annexation in the future.

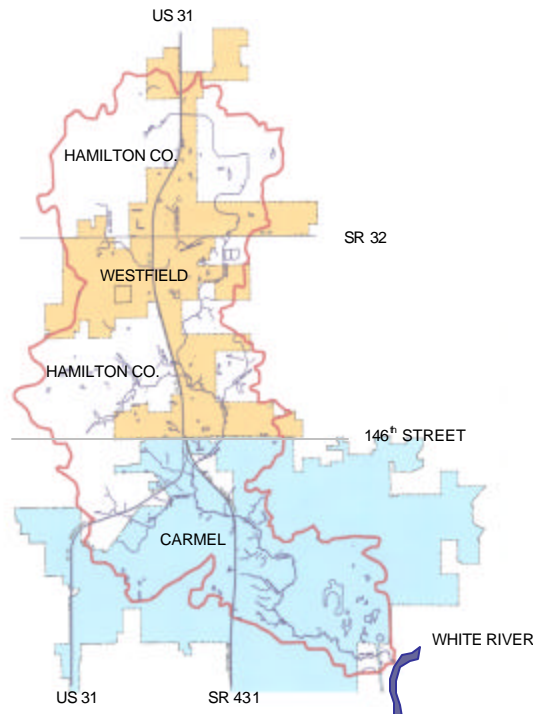


Figure 1-1 – Cool Creek Watershed

Recently, there has been growing interest and concern regarding stormwater design and management practices and their effectiveness in controlling the quantity *and quality* of stormwater runoff. This issue is of special concern given rapid growth in the Westfield area and pending requirements from the United States Environmental Protection Agency (US EPA) and the Indiana Department of Environmental Management (IDEM).

New federal regulations promulgated by the US EPA and administered by IDEM require Hamilton County, Carmel, and Westfield (and other communities throughout the country) to improve the quality of stormwater runoff. Stormwater runoff is a leading source of stream impairment due to pollutants that collect on parking lots, streets, highways, commercial, industrial and residential areas and wash off during rain events. These new regulations will require communities to educate and involve the public on stormwater quality issues, minimize erosion from construction sites, improve the long-term quality of stormwater being discharged from new developments, and develop effective municipal housekeeping operations to minimize stormwater pollution.

Hamilton County (through the County Surveyors Office), Westfield and Carmel entered into an agreement in 2001 to complete a thorough evaluation of stormwater management in the watershed. Clark Dietz, Inc. was retained to develop a Cool Creek Watershed Management Plan that includes recommendations to correct existing stormwater problems and prevent future problems from occurring as the watershed continues to develop.

A “Watershed Management Plan” can mean many things to different stakeholders, so it is important to identify scope of work for this plan. The focus of the study was on stormwater issues on the main channel of Cool Creek and its major tributaries. There are other isolated stormwater problem areas in the watershed (referred to in this report as “neighborhood” problem areas). Though some of these problem areas were identified (as part of staff interviews and public input) and located on problem area maps, detailed analysis and solution development for these areas was beyond the scope of this project.

This project also included an evaluation of water quality issues in the watershed, including a general review of the condition of the riparian corridor, a stream water quality sampling program, an evaluation of streambank erosion problems, a review of water quality violations (NPDES permit related), and an assessment of best management practices (BMPs) in the watershed. Detailed wetland delineations or ratings, biodiversity surveys, or other ecological evaluations were beyond the scope of this project, but may be considered in the future.

1.2 PROJECT SCOPE

Given the above background and purpose, the following is a summary of the scope of work for the project:

<i>Inventory and Problem Identification</i>	Existing information was gathered and evaluated. Sources included previous reports and studies, interviews with staff, meetings with developers, public meetings, and field reconnaissance. This information was used to compile a problem area map and identify areas for additional analysis and solution development.
<i>Problem Analysis</i>	Hydrologic and hydraulic computer models were developed to analyze identified problems and evaluate improvement alternatives. A stormwater quality evaluation was also performed under this task.
<i>Solution Development</i>	Alternative solutions were developed and evaluated. Solutions included bridge and culvert replacements, streambank stabilization projects, regional detention facilities, and land use policy modifications.

<i>Recommendations and Implementation</i>	This work task included recommending capital and maintenance projects, modifications to stormwater management practices, and identifying costs and implementation issues.
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<i>Watershed Management Plan Report</i>	This work element involved compiling the above information into this report.
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1.3 REPORT ORGANIZATION

This report has been organized to follow the scope of services in the order shown above. The remaining chapters of this report present the following information:

<i>Chapter 2 Inventory</i>	Summarizes maps, plans, reports, ordinances, standards, and other information used in completing the project.
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<i>Chapter 3 Problem Identification</i>	Describes how problem areas were identified. Also presents the problems that were selected for detailed analysis and solution development.
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<i>Chapter 4 Water Quality Evaluation</i>	Describes the general condition of the riparian corridor along Cool Creek, discusses wetlands in the watershed and along the stream, identifies potential pollutant sources in the watershed, and presents the stream sampling program and results. This chapter also includes a general description of how this watershed plan may be useful to Carmel, Westfield and Hamilton County and complying with upcoming stormwater quality regulations (NPDES Phase II, or Rule 13).
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<i>Chapter 5 Hydrologic Analysis</i>	Describes the hydrologic model development and analysis results. Includes an evaluation of the effectiveness of current detention requirements in controlling stormwater on an overall watershed basis.
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<i>Chapter 6 Hydraulic Analysis</i>	Describes the hydraulic models that were developed to evaluate solutions to stream related problems. Also includes floodplain mapping of previously unmapped tributaries.
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<i>Chapter 7 Solution Development</i>	Presents solutions to the various problems that were identified through the problem identification and hydrologic/hydraulic analyses. Solutions were developed for stream flooding problems, streambank problems, and selected “neighborhood” problems.
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<i>Chapter 8 Recommendations, Implementation, and Funding</i>	Summarizes recommendations, implementation issues, and funding options for the various categories of improvement projects.
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